



# STAT2170

## Applied Statistics

Session 2, Special circumstance 2020

*Department of Mathematics and Statistics*

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### Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

### Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

## General Information

### Unit convenor and teaching staff

Convenor/Lecturer

Karol Binkowski

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Contact via 9850 7473

12WW 614

Please refer to iLearn

Lecturer

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### Credit points

10

### Prerequisites

FOSE1015 or STAT170(P) or STAT1170 or STAT171 or STAT1371 or STAT150 or STAT1250

### Corequisites

### Co-badged status

STAT6180

### Unit description

This unit aims to extend and broaden statistical experience from 1000-level statistics units, with a focus on application to real-world analysis. It covers relationships between categorical or continuous explanatory variables and a continuous response variable using the techniques of one-way and two-way analysis of variance and simple and multiple linear regression. Data management, report writing, graphical presentation of results, and power analysis are discussed.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

On successful completion of this unit, you will be able to:

- ULO1:** Summarise data graphically and numerically and interpret them.
- ULO2:** Apply appropriate statistical methods, such as one-way ANOVA, two-way ANOVA and multiple regression, to answer research questions.
- ULO3:** Justify and evaluate the assumptions underlying the models, and modify the analysis if needed.
- ULO4:** Use statistical software to create model output and interpret them.
- ULO5:** Demonstrate foundational learning skills including active engagement in their learning process.

## General Assessment Information

**HURDLES:** Participation quiz is a hurdle requirement to be satisfied on a weekly basis. Completing and passing, at least, 9 out of 11 of the SGTA Participation Quizzes is a requirement to pass the unit. The mark of the participation quiz does not count towards the final grade.

**ASSIGNMENT SUBMISSION:** Assignment submission will be online through the iLearn page.

Submit assignments online via the appropriate assignment link on the iLearn page. A personalised cover sheet is not required with online submissions. Read the submission statement carefully before accepting it as there are substantial penalties for making a false declaration.

- Assignment submission is via iLearn. You should upload this as a single PDF file.
- Please note the quick guide on how to upload your assignments provided on the iLearn page.
- It is your responsibility to make sure your assignment submission is legible.
- If there are technical obstructions to your submitting online, please email us to let us know as early as possible, so we can help you.

You may submit as often as required prior to the due date/time. Please note that each submission will completely replace any previous submissions. It is in your interests to make frequent submissions of your partially completed work as insurance against technical or other problems near the submission deadline.

**LATE SUBMISSION OF WORK:** All assessment tasks must be submitted by the official due date and time. In the case of a late submission for a non-timed assessment (e.g. an assignment), if special consideration has NOT been granted, 20% of the earned mark will be deducted for each 24-hour period (or part thereof) that the submission is late for the first 2 days (including weekends and/or public holidays). For example, if an assignment is submitted 25 hours late, its mark will attract a penalty equal to 40% of the earned mark. After 2 days (including weekends

and public holidays) a mark of 0% will be awarded. Timed assessment tasks (e.g. tests, examinations) do not fall under these rules.

**FINAL EXAM POLICY:** It is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, that is, the final day of the official examination period. The only excuse for not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these special circumstances, you may apply for special consideration via [ask.mq.edu.au](https://ask.mq.edu.au).

If you receive special consideration for the final exam, a supplementary exam will be scheduled in the interval between the regular exam period and the start of the next session. By making a special consideration application for the final exam you are declaring yourself available for a resit during this supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application.

You can check the supplementary exam information page on FSE101 in iLearn ([bit.ly/FSESupp](https://bit.ly/FSESupp)) for dates, and approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Participation Quiz</a>	0%	Yes	Weekly
<a href="#">iLearn Quiz</a>	10%	No	Week 4
<a href="#">Mid-Semester Test</a>	20%	No	Week 7
<a href="#">Assignment</a>	20%	No	Week 11
<a href="#">Final Exam</a>	50%	No	Formal Examination period

### Participation Quiz

Assessment Type <sup>1</sup>: Participatory task

Indicative Time on Task <sup>2</sup>: 6 hours

Due: **Weekly**

Weighting: **0%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

Completing and passing, at least, 9 out of 11 of the SGTA Participation Quizzes are requirements to pass the unit. This is a hurdle requirement. The mark of the participation quiz does not count towards the final grade.

On successful completion you will be able to:

- Demonstrate foundational learning skills including active engagement in their learning process.

## iLearn Quiz

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 1 hours

Due: **Week 4**

Weighting: **10%**

The quiz will become available in Week 3 and due in Week 4. Please check the iLearn site for the exact due date. The duration of the quiz will be 60 minutes and will assess the material covered in Lecture Weeks 1-2 and your ability to use statistical software to conduct statistical analyses. It is your responsibility to find an appropriate location with a reliable internet connection where you can complete the exam. It is advisable to plan this in advance.

On successful completion you will be able to:

- Summarise data graphically and numerically and interpret them.
- Apply appropriate statistical methods, such as one-way ANOVA, two-way ANOVA and multiple regression, to answer research questions.
- Justify and evaluate the assumptions underlying the models, and modify the analysis if needed.
- Use statistical software to create model output and interpret them.

## Mid-Semester Test

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 1 hours

Due: **Week 7**

Weighting: **20%**

The test will have a form of an open-book iLearn quiz similar in structure to the Week 4 iLearn quiz. The test will cover material from Lecture Weeks 1-5. The goal of the assessment is to assess statistical skills and knowledge.

On successful completion you will be able to:

- Summarise data graphically and numerically and interpret them.
- Apply appropriate statistical methods, such as one-way ANOVA, two-way ANOVA and multiple regression, to answer research questions.
- Justify and evaluate the assumptions underlying the models, and modify the analysis if needed.
- Use statistical software to create model output and interpret them.

## Assignment

Assessment Type <sup>1</sup>: Quantitative analysis task

Indicative Time on Task <sup>2</sup>: 10 hours

Due: **Week 11**

Weighting: **20%**

The assignment will cover all learning outcomes and focus mainly on the material covered in Lecture Weeks 6-9.

On successful completion you will be able to:

- Summarise data graphically and numerically and interpret them.
- Apply appropriate statistical methods, such as one-way ANOVA, two-way ANOVA and multiple regression, to answer research questions.
- Justify and evaluate the assumptions underlying the models, and modify the analysis if needed.
- Use statistical software to create model output and interpret them.
- Demonstrate foundational learning skills including active engagement in their learning process.

## Final Exam

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 2 hours

Due: **Formal Examination period**

Weighting: **50%**

The Final Examination will be an open book exam.

On successful completion you will be able to:

- Summarise data graphically and numerically and interpret them.
- Apply appropriate statistical methods, such as one-way ANOVA, two-way ANOVA and multiple regression, to answer research questions.
- Justify and evaluate the assumptions underlying the models, and modify the analysis if needed.
- Use statistical software to create model output and interpret them.

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<sup>1</sup> If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

<sup>2</sup> Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

## Delivery and Resources

**We have 3 hours of lectures and 1 hour of SGTA per week.**

### Textbook

There is no prescribed textbook.

### Software

You are required to use R/RStudio to perform data analyses. You will use R/RStudio as part of the SGTA classes. You can find more information on RStudio at their web site: <https://www.rstudio.com/>. The software is freely available to download at no cost for all standard operating systems (Windows, Mac OS and Linux) at <https://www.rstudio.com/products/rstudio/download/>.

### Additional References

These recommended books are available in Reserve at the library.

- Moore, D.S., McCabe, G. P. and Craig, B.A. (2017) Introduction to the Practice of Statistics, Ninth Edition (W.H. Freeman)

## Unit Schedule

Week	Lectures	Work due
1	Course introduction; One-sided tests; Type I and Type II error; Introduction to R/RStudio	
2	Modified two-sample t-test; Assessing normality and equal variance assumptions	

3	One way ANOVA	
4	One way ANOVA, Multiple comparisons	iLearn quiz
5	Transformations; Non-parametrics; Power and Sample Size	
6	Data management; R Markdown; Simple linear regression	
7	Simple linear regression and model validation; Multiple regression	Mid Semester Exam
	Mid-Semester Break	
8	Multiple regression and model validation	
9	Extensions and examples of multiple regression	
10	Two-way ANOVA	
11	Two-way ANOVA continued and multiple comparisons	Assignment
12	Two-Way ANOVA and multiple regression connection	
13	Revision	

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/student-policy-gateway) (<https://students.mq.edu.au/support/study/student-policy-gateway>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.



If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/student-conduct>

## Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/](http://www.mq.edu.au/about_us/)

[offices\\_and\\_units/information\\_technology/help/](#).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Changes since First Published

Date	Description
13/07/2020	Deleted a sentence from Delivery&Resources section: "You can use the software in the labs, or on your laptop when online off-campus." as I'm not sure if those labs can run RMarkdown (RStudio+Latex). The plan is to make Rmarkdown running on students laptops. The backup plan is to use rstudio.cloud, which is limited to 15h free.